



ENSO flavors in a tree-ring $\delta^{18}\text{O}$ record from Indonesia

Karina Schollaen (1), Christina Karamperidou (2), and Gerhard Helle (1)

(1) Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences, 5.2 Climate Dynamics and Landscape Evolution, Potsdam, Germany, (2) Department of Meteorology, University of Hawai'i at Manoa, Honolulu, Hawai'i, USA

The existence of so-called ENSO flavors (Cold Tongue and Warm Pool El Niño), their underlying mechanisms and potential changes in their frequency of occurrence is an active field of research in the climate science community. Previous work has shown the distinct teleconnection patterns of ENSO flavors and SST, precipitation and salinity in the tropics, which should be taken into account when interpreting palaeo-climate proxies. At the same time, proxies from key locations with distinct ENSO-flavors signals can provide long continuous records, essential for identifying possible trends and (multi)decadal variability of ENSO flavor occurrence. Here, we show that one such key region is Java (Indonesia), where the ENSO influence on precipitation is significant for Warm Pool ENSO, and non-significant for Cold Tongue ENSO. We do so by investigating the ENSO signal in a 108-year long (1900-2007) tree-ring $\delta^{18}\text{O}$ record of teak (*Tectona grandis*) trees growing in a lowland rain forest in Central Java. Climate response analysis with regional monthly rainfall data reveals that the tree-ring $\delta^{18}\text{O}$ record is significantly correlated to rainfall, and is sensitive to the occurrence of Warm Pool ENSO events, as well as La Niña events. The results presented here demonstrate the ability of tree-ring stable isotope records to provide palaeo-climate records able to distinguish between the two ENSO flavors, with broad applicability to studies on past ENSO variability.